

Individual Evaluation Form

Proposal Number: 07-CCSP_07-0001

Organization Name: LMD/IPSL

Principal Investigator: Emily Chien

Evaluation Summary

Solicitation Title: Earth Science Document Review
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Evaluation Status: Submitted (08/01/2007 @ 03:07:31 EDT by Verne Kaupp)
Review: CCSP - AGRICULTURE CHAPTER ONLY [CCSP AGRICULTUR]
Reviewer: Verne Kaupp (Reviewer)

Overall Grade:

Evaluation Criteria

Question 1 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

1. Is the charge clearly described in the report chapter? Are all aspects of the charge fully addressed? See Item, below. 2. Do the authors go beyond their charge or their expertise? No. Item: The current Introduction is acceptable as it is, but it doesn't seem to fully address all aspects of the charge, or to promote the sense of urgency that I feel is needed. Something like the following could strengthen the Introduction, but is not essential: The efficiency of agriculture (Ag Eff), defined as the ratio of output to input, has improved markedly over the past century. An arbitrary but telling measure is that in 1900 one farmer in the U.S. could feed approximately 2 1/2 people and today that number is well over 100. Certainly, this 40s-fold increase in Ag Eff is a consequence of many things; technological progress driven by the forces of technological change, economic growth, trade, etc. With the population of the Earth estimated at 6 billion people in 2000 and forecast to be 8 billion by 2020, a conservative estimate would be that an annual 1.3% increase in Ag Eff would be necessary in that period to feed the burgeoning human population, assuming present diets remain invariant. Increasing the Ag Eff today requires both technological progress to solve the problems, more efficient use of agricultural resources, and now it also requires consideration of the affects of a changing climate. For example, an increased understanding of the ties between global climate phenomena and local weather events is needed so that agricultural production can be optimized for local growing conditions. The relationship between climate change and agriculture is complex. Climate change can radically alter rainfall patterns and necessitate large-scale population movement and primary changes in agriculture. Such dramatic climate changes are known to have occurred in the past in the Mediterranean region (for example, abandonment of Troy and Petra) and in parts of Meso-America in the 6th century A.D. Ag Eff, then, is driven by events around the world (e.g., local practices, technological advances and problems, climate, politics, wars, natural hazards, and meteorological events). The agricultural sector has a long history (dating back to the LACIE and AgRISTARS programs) in using Earth observations for decision-support. Today these data are used by agencies of the Federal government, commodity trading companies, farmers, relief agencies, other governments, and essentially anyone with an interest in crop production at a global scale. It clearly serves a vital function within the global agricultural market. An approach, among others, to increasing Ag Eff is to expand and enhance uses of Earth observation data for (1) policy and resource management decision-support, (2) its expanding role in monitoring and measuring climate change affects, and (3) for its potential value in providing policy and resource climate change decision-support. The foremost example of this is found in the USDA's space-based crop-monitoring decision-support system formerly known as PECAD. Reorganization at USDA finds the PECAD functionality, but not the name, residing within the USDA/FAS/OGA/IAD/IPA. Description of the PECAD decision-support system, its functionality, analysis style, how it deals with making decisions under uncertainty, and its future uses form the basis of this chapter. All references cited use the older PECAD nomenclature and so do the discussions and descriptions in this chapter.

Question 2 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

1. Are the conclusions and recommendations adequately supported by evidence, analysis, and argument? A Conclusions and Recommendations section is not included. 2. Are the uncertainties or incompleteness in the evidence explicitly recognized? Yes, but the evidence comes from using PECAD as a case study. It serves to illustrate one way to go about measuring Ag Eff and it serves to infer a climate/agriculture relationship. The signal discussed is, however, confused with many variables besides climate change and the conclusion can't be directly drawn that PECAD provides evidence of climate change. 3. If any recommendations are based on value judgments or the collective opinions of the authors, is this acknowledged and are adequate reasons given for reaching those judgments? No recommendations based on value judgments.

Question 3 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

1. Are the data and analysis handled competently? The Chapter uses the PECAD case study to illustrate needs. The discussion is very good, but no analysis is provided. It assumes the reader is swayed by the PECAD example. 2. Are statistical methods applied appropriately? None used.

Question 4 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

1. Are sensitive policy issues treated with proper care? Yes 2. Are the advantages and disadvantages of alternative options, including the status quo considered? No. It would be beneficial to have each of the potential decision-support needs for Ag Eff (e.g., (a) policy and resource management, (b) monitoring and measuring climate change affects, (c) providing policy and resource climate change) analyzed and discussed.

Question 5 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

1, Are the report chapter's exposition and organization effective? Yes. 2. Is the title appropriate? Yes

Question 6 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

1. Is the report chapter fair? Is its tone impartial and devoid of special pleading? Yes.

Question 7 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

Are chapter-relevant appendices, if any, appropriate to the charge? None used.

Question 8 : Please distinguish issues you consider to be of general/major concern(s) from other, less significant point(s).

What other significant improvements, if any, might be made in the report chapter? 1. Provide discussion that USDA/FAS/PECAD is now USDA/FAS/OGA/IAD/IPA to guide the reader through the current discussion and references and prepare the reader for future references to this system. 2. Operational value provided by remotely sensed information, for many decision-support systems, is, in one sense, measured by the time delay (data latency) from acquisition to delivery. This is often a crucial determinant of value for operational users across the board, not just for Ag Eff. Research needs, however, can often be met with stale data. There are, in addition, other technology needs unique for operational users which may greatly enhance future operational uses of NASA information while not significantly impacting research needs. 3. Most operational users of remotely-sensed information are best served when their priority technology needs are met. A few common technology requirements cut across many operational disciplines and those needs might be summarized in a table. Such a table might include (these items are essentially included in the text, but I think a tabular listing enhances these needs): o Data latency ; Delay from acquisition to distribution (Real-time, Near Real-time, etc.) o Data time step ; How often the data are acquired (Repeat interval) o Coverage ; Spatial extent o Product accuracy ; Verification & validation requirements o Resolution ; Spatial, spectral, temporal, radiometric needs) o Etc. 4. Following the recent recommendations of the NRC Decadal Survey, it would be very useful to point out the needs for operational community feedback to new mission design. This requires NASA to change its model for designing new missions, but having operational experts providing priority technological needs at the earliest moments of a mission design should significantly enhance both the research and operational uses of resultant observations. 5. It might be useful to suggest that satellite data and scientifically derived products are, at best, estimates of reality drawn from a statistical population. 6. It might be useful to suggest that scientific results derived from small regions and laboratory conditions might not scale directly to fulfill operational needs. Additional research and development may be required to verify that you get what you expected and to validate its accuracy. 7. More discussion on Ag Eff decision-support needs under climate-change conditions. 8. Conclusions and Recommendations discussion that summarizes findings and ties the climate-change needs back to the needs and sense of urgency of the Introduction. 9. The information provided is good but is too PECAD-centric. I think the take-away from this chapter is too weak, it could be more broad-ranging and much harder-hitting.